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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/043,812	01/10/2002	Satoshi Seo	07977-292001-US5444	7853
26171	7590	08/23/2005	EXAMINER	
FISH & RICHARDSON P.C. P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			COLON, GERMAN	
			ART UNIT	PAPER NUMBER
			2879	

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/043,812	Applicant(s) SEO ET AL.	
	Examiner German Colón	Art Unit 2879	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 56-80 is/are pending in the application.
- 4a) Of the above claim(s) 56-59 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 60-80 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 April 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. The Amendment, filed on June 08, 2005, has been entered and acknowledged by the Examiner.

### ***Specification***

2. The disclosure is objected to because of the following informalities:

The specification refers to the organic compound  $\alpha$ -NPD on at least Page 23, last paragraph, line 2; and Page 24, last paragraph, line 5. However, in other locations such as Page 24, paragraphs 1 and 4, the aforementioned organic compound is represented as  $\acute{\alpha}$ -NPD. It is understood that the latter is a typographical error and the intended compound is the former.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 61-64 and 73-76 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Independent claims 61 and 73 recite the limitation of “a concentration of the hole injection compound decreases monotonically from the anode to the cathode”. While the specification discloses a change in the concentration of the compounds forming the mixed layer, it provides no support for a specific gradient, such as a monotonic decrease. The Examiner notes that not every gradual change is necessarily monotonic. Regarding claims 62-64 and 74-76, the claims are rejected over the reasons stated in claims 61 and 73, because of their dependency status from said claims.

*Claim Rejections - 35 USC § 102*

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-3, 60, 65-72 and 77-80 are rejected under 35 U.S.C. 102(e) as being anticipated by Seo et al. (US 2002/0086180).

Regarding claims 1 and 69, Seo discloses a light emitting device comprising an organic light emitting element (see at least Figs. 8-10) comprising:

an anode **802**; a cathode **806**; and an organic compound film sandwiched between the anode and the cathode,

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wherein the organic compound film comprises a blocking compound (see paragraph [0043]) capable of stopping the movement of holes or electrons and at least one compound selected from the group consisting of: HIL, HTL, ETL and EIL (see Figs. 8-10),

wherein the blocking compound and the at least one compound selected are materials capable of undergoing vacuum evaporation (see disclosed materials),

wherein the organic compound film comprises a region in which the two compounds are mixed (see at least paragraphs [0079], [0081] and [0177]), and

wherein a concentration change in the region is continuous (see at least paragraph [0044] in view of Fig. 10) and/or the electric current versus electric voltage property of the organic light emitting elements show a rectification property. The Examiner notes that the reference discloses the organic light emitting material being organic diodes (see at least paragraphs [0046] and [0083]), and it is known in the art that diodes have a rectification property.

Regarding claims 2-3 and 70-71, Seo discloses a light emitting compound guess being included in the mixed region (see at least paragraphs [0082] and [0172], in view of at least Fig. 10).

Regarding claims 60 and 72, Seo discloses the light emitting device being included in one of a display, a video camera, a digital camera and a portable computer (see Figs. 17-18).

Referring to claims 65 and 77, Seo discloses a light emitting device comprising an organic light emitting element (see at least Figs. 8-10) comprising:

an anode **802**; a cathode **806**; and an organic compound film sandwiched between the anode and the cathode,

wherein the organic compound film comprises at least two compounds selected from the group consisting of ETL and EIL (see Figs. 8-10 and at least paragraph [0036]),

wherein the two compounds are materials capable of undergoing vacuum evaporation (see disclosed materials),

wherein the organic compound film comprises a region in which the two compounds are mixed (see at least paragraph [0036] in view of Fig. 10), and

wherein the electric current versus electric voltage property of the organic light emitting elements show a rectification property. The Examiner notes that the reference discloses the organic light emitting material being organic diodes (see at least paragraphs [0046] and [0083]), and it is known in the art that diodes have a rectification property.

Referring to claims 66-67 and 78-79, the claims are rejected over the reasons stated in the rejection of claims 2-3.

Referring to claims 68 and 80, the claims are rejected over the reasons stated in the rejection of claim 60.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 69 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakimoto et al. (US 2001/0043044) in view of So (US 5,925,980).

Regarding claim 69, Wakimoto discloses a light emitting device comprising an organic light emitting element comprising:

an anode 2;

a cathode 7; and

an organic compound film 3,4,5,6 sandwiched between the anode and the cathode,

wherein the organic compound film comprises a blocking compound 5 (HBL) and at least one compound selected from the group consisting of:

a hole injecting compound (HIL); a hole transporting compound (HTL); an ETL; and EIL (see paragraphs [0024]-[0025]);

wherein the blocking compound and the at least one compound are materials capable of undergoing vacuum evaporation, and

wherein the organic compound film comprises a region 45 in which the two compounds are mixed. Wakimoto is silent regarding the limitation of “a concentration change in the region is continuous”.

However, in the same field of endeavor, So discloses an organic light emitting device having a mixed region and teaches to provide a continuous concentration change in order to obtain two intermixed material layers so that no fixed interface is formed, resulting in an improved adhesion between the layers and a smooth movement of the carriers thereacross (see Col. 4, lines 15-20). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a continuous concentration change in the mixed region of Wakimoto, with the purpose of obtaining two intermixed material layers so that no fixed

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interface is formed, resulting in an improved adhesion between the layers and a smooth movement of the carriers thereacross.

Regarding claim 69, Wakimoto discloses the light-emitting devices being included in a display.

### *Response to Arguments*

9. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

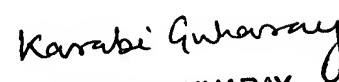
### *Contact Information*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to German Colón whose telephone number is 571-272-2451. The examiner can normally be reached on Monday thru Thursday, from 8:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
gc

  
KARABI GUHARAY  
PRIMARY EXAMINER